Hoshizaki America, Inc.

Commercial Series
Refrigerated Kitchen Equipment

Models
Undercounter
Worktop
Prep Table

SERVICE MANUAL

"A Superior Degree of Reliability"

www.hoshizaki.com

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⚠ WARNING

Only qualified service technicians should install and service the appliance. To obtain the name and phone number of your local Hoshizaki Certified Service Representative, visit www.hoshizaki.com. No service should be undertaken until the technician has thoroughly read this Service Manual. Failure to service and maintain the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage. Proper installation is the responsibility of the installer. Product failure or property damage due to improper installation is not covered under warranty.

Hoshizaki provides this manual primarily to assist qualified service technicians in the service of the appliance.

Should the reader have any questions or concerns which have not been satisfactorily addressed, please call, send an e-mail message, or write to the Hoshizaki Technical Support Department for assistance.

Phone: 1-800-233-1940; (770) 487-2331
Fax: 1-800-843-1056; (770) 487-3360

E-mail: techsupport@hoshizaki.com

HOSHIZAKI AMERICA, INC.
618 Highway 74 South
Peachtree City, GA 30269
Attn: Hoshizaki Technical Support Department

Web Site: www.hoshizaki.com

NOTE: To expedite assistance, all correspondence/communication MUST include the following information:

- Model Number ____________________________
- Serial Number _____________________________
- Complete and detailed explanation of the problem.

IMPORTANT
This manual should be read carefully before the appliance is serviced. Read the warnings and guidelines contained in this booklet carefully as they provide essential information for the continued safe use, service, and maintenance of the appliance. Retain this booklet for any further reference that may be necessary.

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Important Safety Information

Throughout this manual, notices appear to bring your attention to situations which could result in death, serious injury, damage to the appliance, or damage to property.

⚠ **WARNING**	**Indicates a hazardous situation which could result in death or serious injury.**
NOTICE	**Indicates a situation which could result in damage to the appliance or property.**
IMPORTANT	**Indicates important information about the use and care of the appliance.**

⚠ WARNING

This appliance should be destined only to the use for which it has been expressly conceived. Any other use should be considered improper and therefore dangerous. The manufacturer cannot be held responsible for injury or damage resulting from improper, incorrect, and unreasonable use. Failure to service and maintain the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage.

To reduce the risk of death, electric shock, serious injury, or fire, follow basic precautions including the following:

- Only qualified service technicians should install and service this appliance.
- This appliance must be installed in accordance with applicable national, state, and local codes and regulations.
- To reduce the risk of electric shock, do not touch the plug with damp hands.
- Unplug the appliance before servicing.
- This appliance requires an independent power supply of proper capacity. See the nameplate for electrical specifications. Failure to use an independent power supply of proper capacity can result in a tripped breaker, blown fuse, damage to existing wiring, or component failure. This could lead to heat generation or fire.
- **THIS APPLIANCE MUST BE GROUNDED.** This appliance is equipped with a NEMA 5-15 three-prong grounding plug to reduce the risk of potential shock hazards. It must be plugged into a properly grounded, independent 3-prong wall outlet. If the outlet is a 2-prong outlet, it is your personal responsibility to have a qualified electrician replace it with a properly grounded, independent 3-prong wall outlet. Do not remove the ground prong from the power cord and do not use an adapter plug. Failure to follow these instructions may result in death, electric shock, or fire.
- Do not use an extension cord.
- Do not use an appliance with a damaged power cord. The power cord should not be altered, jerked, bundled, weighed down, pinched, or tangled. Such actions could result in electric shock or fire. To unplug the appliance, be sure to pull the plug, not the cord, and do not jerk the cord.

⚠ WARNING, continued

- The GREEN ground wire in the factory-installed power cord is connected to the appliance. If it becomes necessary to remove or replace the power cord, be sure to connect the power cord's ground wire.
- Do not splash, pour, or spray water directly onto or into the appliance. This might cause short circuit, electric shock, corrosion, or failure.
- Do not make any alterations to the appliance. Alterations could result in electric shock, injury, fire, or damage to the appliance.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be properly supervised around this appliance.
- Do not climb, stand, or hang on the appliance or door or allow children or animals to do so. Do not climb into the appliance or allow children or animals to do so. Death or serious injury could occur or the appliance could be damaged.
- Be careful not to pinch fingers when opening and closing the doors or rail cover (prep table models). Be careful when opening and closing the doors or rail cover when children are in the area.
- Open and close the doors and rail cover (prep table models) with care. Opening the doors or rail cover too quickly or forcefully may cause injury or damage to the appliance or surrounding equipment.
- Do not use combustible spray or place volatile or flammable substances in or near the appliance. They might catch fire.
- Keep the area around the appliance clean. Dirt, dust, or insects in the appliance could cause harm to individuals or damage to the equipment.
- Do not throw anything onto the shelves or load any single shelf with more than 120 lb. (54.5 kg) of product. They might fall off and cause injury.
- This appliance is designed only for temporary storage of food. Employ sanitary methods. Use for any other purposes (for example, storage of chemicals or medical supplies such as vaccine and serum) could cause deterioration of stored items.
- Do not block air inlets or outlets, otherwise cooling performance may be reduced.
- Do not tightly pack the cabinet. Allow some space between items to ensure good air flow. Also allow space between items and interior surfaces.
- Do not put warm or hot foods in the cabinet. Let them cool first, or they will raise the cabinet temperature and could deteriorate other foods in the cabinet or overload the appliance.

⚠ WARNING, continued

- All foods should be wrapped in plastic film or stored in sealed containers. Otherwise foods may dry up, pass their smells onto other foods, cause frost to develop, result in poor appliance performance, or increase the likelihood of cross-contamination. Certain dressings and food ingredients, if not stored in sealed containers, may accelerate corrosion of the evaporator, resulting in failure.
- Do not store items near air outlets. Otherwise, items may freeze up and crack or break causing a risk of injury or contamination of other food.

Additional Warnings for Prep Table Models

- The entire rail must always be covered by rail dividers and pans (1/6 size, up to 6" (15 cm) deep). Otherwise, the appliance will not cool properly.
- Use only 1/6 size pans up to 6" (15 cm) deep. Do not use damaged pans.
- Ingredients must be pre-chilled to 37°F (3°C) or less before placing in rail.
- Keep the rail cover closed when not actively preparing food.
- The rail is for keeping ingredients cool while preparing food. If not actively preparing food for a long period such as overnight, seal pans with plastic wrap in addition to closing the rail cover. Depending on conditions, the cabinet temperature setting may need to be adjusted to prevent items from freezing. Alternatively, seal ingredients and store them in a refrigerator or freezer.

NOTICE

- Protect the floor when moving the appliance to prevent damage to the floor.
- Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction. Do not place anything on top of the appliance in an undercounter installation. There must be at least 1.5" (4 cm) overhead clearance for proper ventilation. The factory-installed rear bumpers must be in place to ensure proper rear clearance. Blockage of airflow could negatively affect performance and damage the appliance.
- Do not allow the appliance to bear any outside weight.
- To prevent deformation or cracks, do not spray insecticide onto the plastic parts or let them come into contact with oil.
- To avoid damage to the gasket, use only the door handle when opening and closing.
- To avoid damage to the top seal, do not lift the appliance by the top panel or remove the top panel.

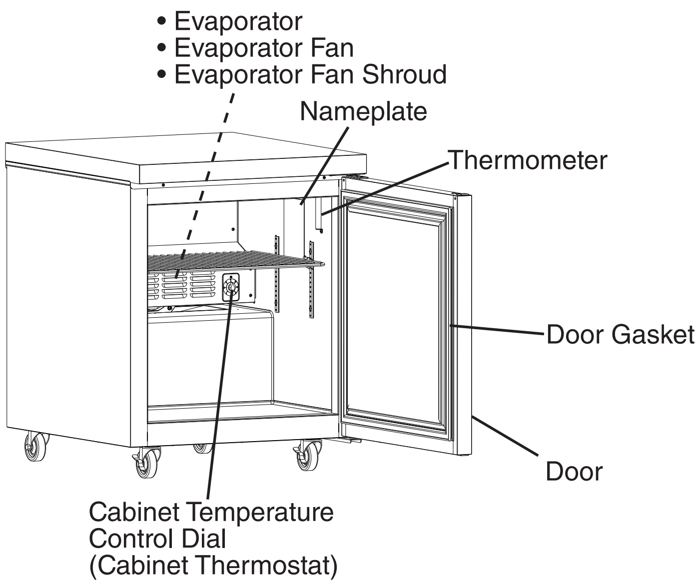
Additional Notice for Prep Table Models

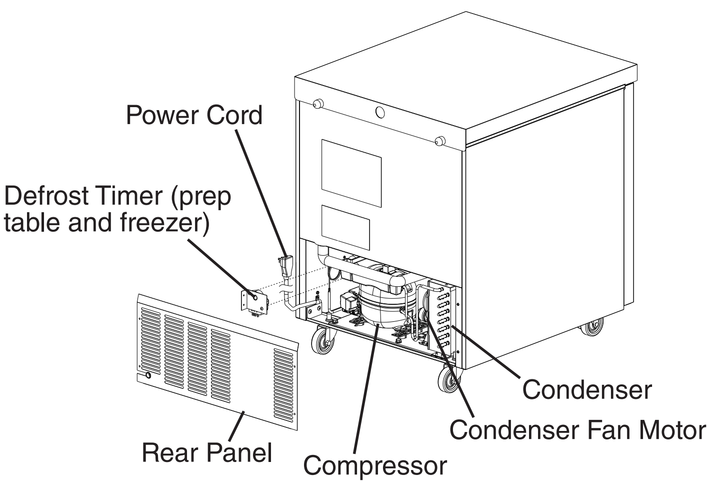
- Do not place anything on top of the rail hood or rail cover and do not lift the appliance by the rail hood or rail cover. The rail hood and rail cover are not designed to bear any outside weight.
- CRMR27-x Prep Table Models: Do not place anything on the air distribution table beneath the pans. The air distribution table is not a load-bearing surface.

I. Construction and Refrigeration Circuit Diagram

A. Construction

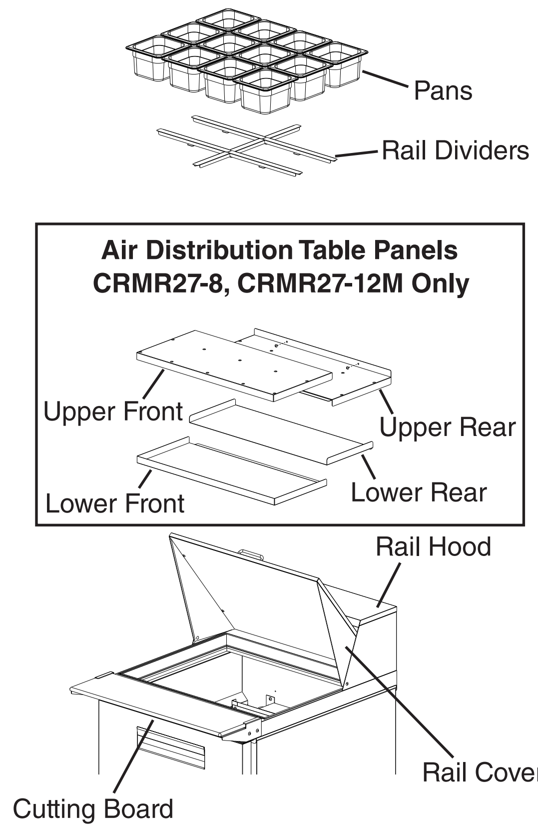
Undercounter, Worktop, Prep Table Common Parts





Model Shown: CRMF27

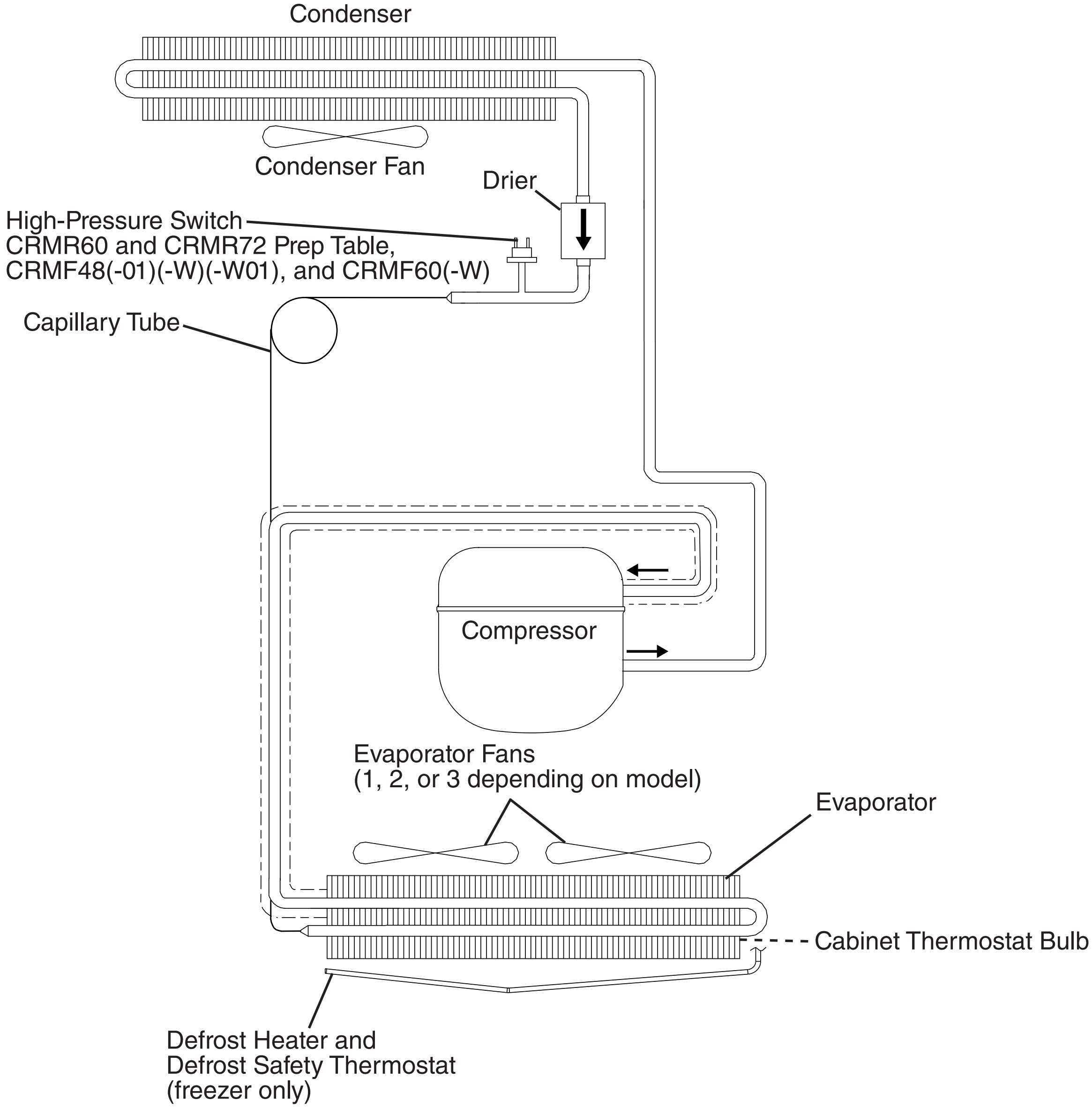
Prep Table Specific Parts



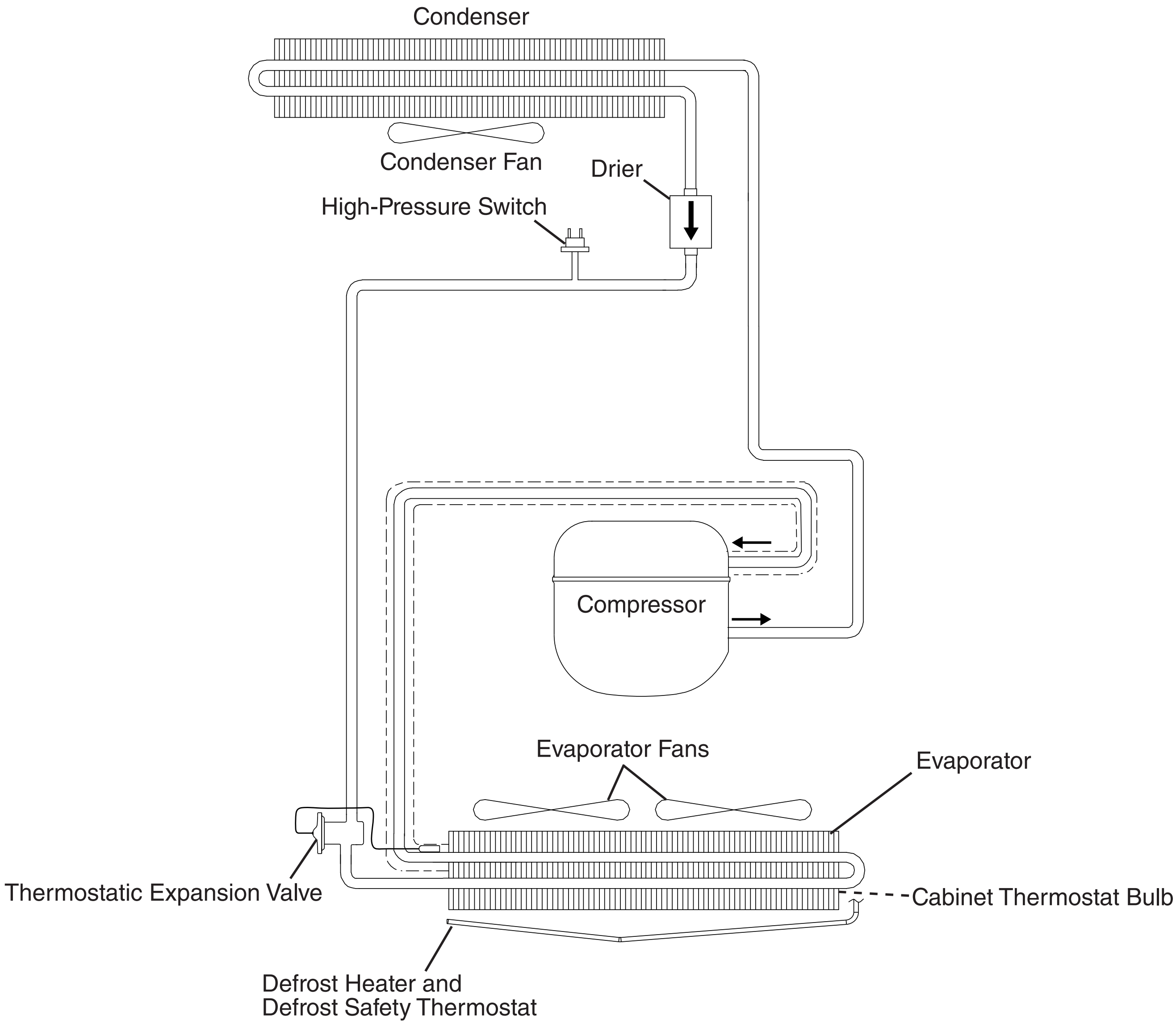
Model Shown: CRMR27-12M

B. Refrigeration Circuit Diagram

1. Refrigerator and Freezer (except CRMF48(-01)(-W)(-W01) auxiliary codes A-5 and B-5)



2. CRMF48(-01)(-W)(-W01) (auxiliary codes A-5 and B-5)



II. Sequence of Operation and Service Diagnosis

The steps in the sequence are as outlined below.
See the table for default cabinet temperature control settings.

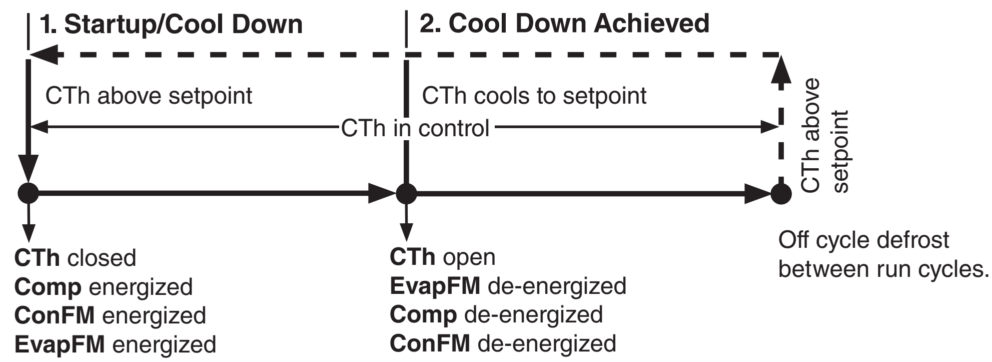
Model	Default Cabinet Temperature Control Setting	Approximate Default Temperature
Undercounter Worktop	Between 4 and 5	Refrigerator: 34°F (1°C) Freezer: -5°F (-21°C)
Prep Table	6	34°F (1°C)

A. Sequence of Operation Flow Chart

1. Refrigerator: Undercounter and Worktop

a) CRMR27(-01)(-W)(-W01), CRMR48(-01)(-W)(-W01)

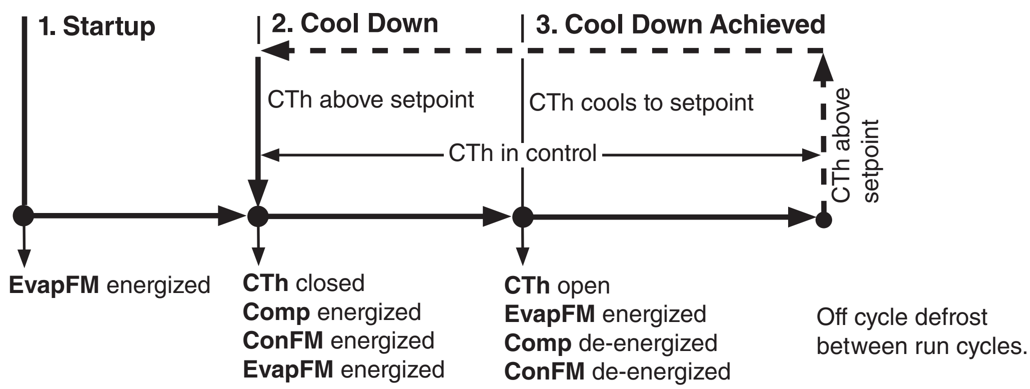
Refrigerator: CRMR27(-01)(-W)(-W01), CRMR48(-01)(-W)(-W01) Sequence Flow Chart



Legend: **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermostat; **EvapFM**–evaporator fan motor

b) CRMR60(-W), CRMR72(-W)

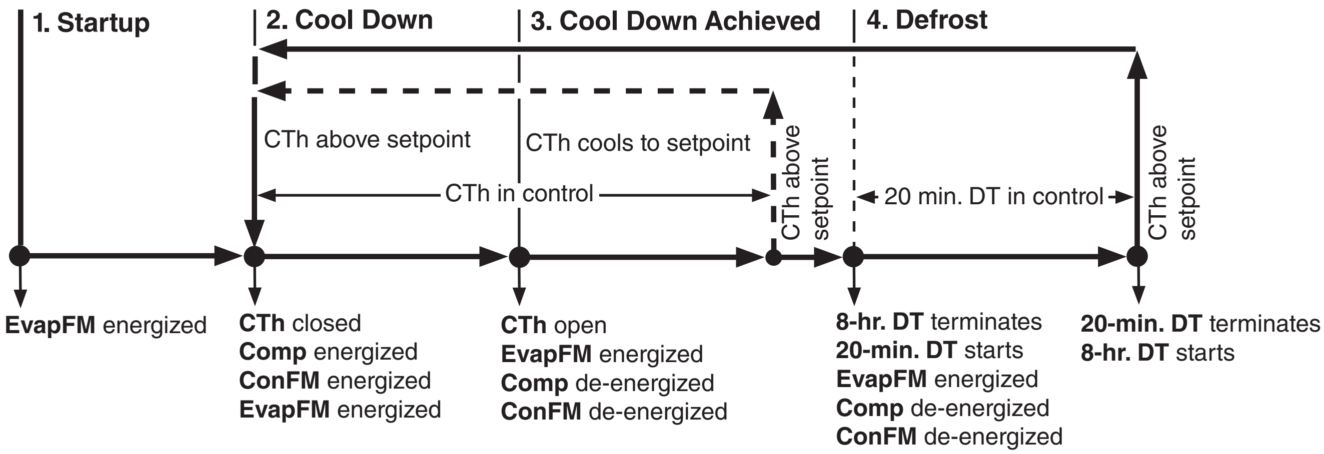
Refrigerator: CRMR60(-W), CRMR72(-W) Sequence Flow Chart



Legend: **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermostat; **EvapFM**–evaporator fan motor

2. Refrigerator: Prep Table

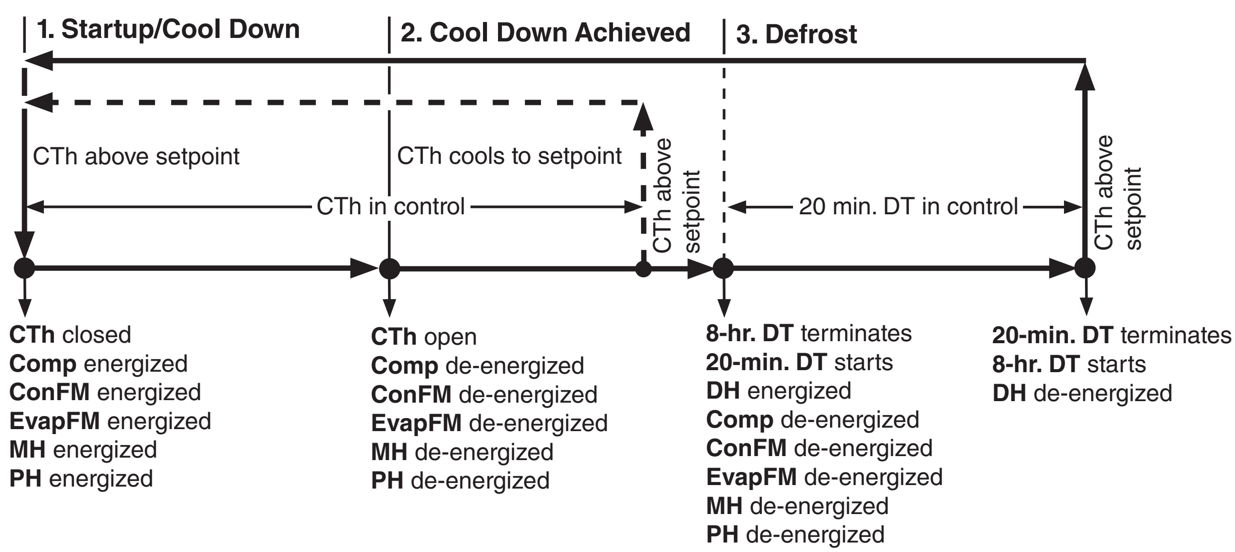
Refrigerator: Prep Table Sequence Flow Chart



Legend: **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermostat; **8-hr. DT**–8-hour defrost timer; **20-min. DT**–20-minute defrost timer; **EvapFM**–evaporator fan motor

3. Freezer: All

Freezer Sequence Flow Chart



Legend: **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermostat; **DH**–defrost heater; **8-hr. DT**–8-hour defrost timer; **20-min. DT**–20-minute defrost timer; **EvapFM**–evaporator fan motor; **MH**–mullion heater; **PH**–perimeter heater

B. Service Diagnosis

⚠ WARNING

- The appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- Risk of electric shock. Use extreme caution and exercise safe electrical practices.
- Moving parts (e.g., fan blade) can crush and cut. Keep hands clear.
- Make sure all food zones are clean after the appliance is serviced.

The diagnostic procedure is a sequence check that allows you to diagnose the electrical system and components. Before proceeding, check for correct installation and proper voltage per nameplate.

See the table for default cabinet temperature control settings.

Model	Default Cabinet Temperature Control Setting	Approximate Default Temperature
Undercounter Worktop	Between 4 and 5	Refrigerator: 34°F (1°C) Freezer: -5°F (-21°C)
Prep Table	6	34°F (1°C)

Note: When checking voltage (115VAC), always choose a white (W) neutral wire to establish a good neutral connection.

1. Refrigerator: Undercounter and Worktop

1) Unplug the appliance from the electrical outlet.

2) Remove the rear panel.

3) Plug the appliance back into the electrical outlet.

a) CRMR27(-01)(-W)(-W01), CRMR48(-01)(-W)(-W01)

4) **Startup/Cool Down**–Temperature above setpoint. CTh closed. Comp, ConFM, and EvapFM energize. **Diagnosis:** Check that Comp, ConFM, and EvapFM energize. If not, confirm that temperature is above setpoint and CTh is closed. Check both terminals of CTh to a neutral (W) for 115VAC. If 115VAC is present on one terminal and not the other, replace CTh. If 115VAC is present on both terminals, check Comp, ConFM, and EvapFM individually.

   Check voltage at Comp, external protector, and Comp terminals. Check Comp windings. Check voltage on ConFM and EvapFM. Check ConFM and EvapFM windings. Check fan blades for binding.

   If Comp, ConFM, and EvapFM are energized and the cabinet does not cool down, check for a restriction in the refrigeration circuit, low refrigerant charge, or inefficient Comp.

5) **Cool Down Achieved**–Temperature cools to setpoint. CTh opens. Comp, ConFM, and EvapFM de-energize. **Diagnosis:** If temperature has cooled to setpoint and Comp, ConFM, and EvapFM do not de-energize, check CTh continuity. If CTh defective, replace CTh.

b) CRMR60(-W), CRMR72(-W)

4) **Startup–**EvapFM energizes. **Diagnosis:** Check that EvapFM energizes. If not, check voltage on EvapFM. Check EvapFM windings. Check fan blades for binding.

5) **Cool Down–**Temperature above setpoint. CTh closed. EvapFM continues. Comp and ConFM energize. **Diagnosis:** Check that EvapFM continues. Check that Comp and ConFM energize. If not, confirm that temperature is above setpoint and CTh is closed. Check both terminals of CTh (BK) to a neutral (W) for 115VAC. If 115VAC is present on one terminal and not the other, replace CTh. If 115VAC is present on both terminals, check Comp, ConFM, and EvapFM.

   Check voltage at Comp, external protector, and Comp terminals. Check Comp windings. Check voltage on ConFM and EvapFM. Check ConFM and EvapFM windings. Check fan blades for binding.

   If Comp, ConFM, and EvapFM are energized and the cabinet temperature does not cool down, check for a restriction in the refrigeration circuit, low refrigerant charge, or inefficient Comp.

6) **Cool Down Achieved**–Temperature cools to setpoint. CTh opens. EvapFM continues. Comp and ConFM de-energize. **Diagnosis:** If cabinet temperature has cooled to setpoint and Comp and ConFM do not de-energize, check CTh continuity. If CTh defective, replace CTh.

2. Refrigerator: Prep Table

1) Unplug the appliance from the electrical outlet.

2) Remove the rear panel.

3) Plug the appliance back into the electrical outlet.

4) **Startup–**EvapFM energizes. **Diagnosis:** Check that EvapFM energizes. If not, check voltage on EvapFM. Check EvapFM windings. Check fan blades for binding.

5) **Cool Down–**Temperature above setpoint. CTh closed. EvapFM continues. Comp and ConFM energize. **Diagnosis:** Check that EvapFM continues. Check that Comp and ConFM energize. If not, confirm that the appliance is not in a defrost cycle, 8-hr. DT is operating properly, temperature is above setpoint, and CTh is closed. Check voltage on 8-hr. DT. In cooling, 115VAC is present on both DT terminal #1 (BK) and DT terminal #4 (BK) to a neutral (W). If 115VAC is present on terminal #2 (R) to a neutral (W), advance DT out of defrost cycle or replace DT. Check both terminals of CTh (BK) to a neutral (W) for 115VAC. If 115VAC is present on one terminal and not the other, replace CTh. If 115VAC is present on both terminals, check Comp, ConFM, and EvapFM. For CRMR60 and CRMR72 prep table, also see "HPS Activation (CRMR60 and CRMR72 Prep Table)" below.

   Check voltage at Comp, external protector, and Comp terminals. Check Comp windings. Check voltage on ConFM and EvapFM. Check ConFM and EvapFM windings. Check fan blades for binding.

   If Comp, ConFM, and EvapFM are energized and the cabinet temperature does not cool down, check for a restriction in the refrigeration circuit, low refrigerant charge, or inefficient Comp.

HPS Activation (CRMR60 and CRMR72 Prep Table): Check continuity of HPS. If open, allow time for system pressure to equalize and HPS to reset. If HPS does not reset, replace HPS and diagnose reason for HPS activation. Confirm ConFM is energized and fan blade turns freely. Check that the condenser coil is not clogged or restricted. Check that there are no restrictions in the refrigeration circuit (drier).

Confirm that the appliance location meets factory requirements:

- This appliance is not intended for outdoor use. Normal operating ambient temperature should be within 45°F to 86°F (7°C to 30°C).
- The appliance should not be located next to ovens, grills, or other high heat producing equipment.

6) **Cool Down Achieved**–Temperature cools to setpoint. CTh opens. EvapFM continues. Comp and ConFM de-energize. **Diagnosis:** If cabinet temperature has cooled to setpoint and Comp and ConFM do not de-energize, check CTh continuity. If CTh defective, replace CTh.

7) **Defrost (Prep Table)–***Defrost Initiation:* 8-hr DT terminates. EvapFM continues. If CTh closed, Comp and ConFM de-energize.

   Defrost Termination: 20-min. DT terminates. EvapFM continues. If CTh closed, Comp and ConFM energize.

   Diagnosis: *Defrost Initiation:* Manually advance DT cam to terminate 8-hr. DT. Confirm Comp and ConFM de-energize or remain de-energized. If not, replace DT.

   Defrost Termination: Wait 20-min. (±3 min.) or advance DT cam to terminate 20-min. DT. If CTh closed, confirm Comp and ConFM energize. If not, check DT voltage terminal #2 (R) to a neutral (W). If 115VAC is present, replace DT.

3. Freezer: All

4) **Startup/Cool Down–**Temperature above setpoint. CTh closed. Comp, ConFM, EvapFM, PH, and MH energize. **Diagnosis:** Check that Comp, ConFM, EvapFM, PH, and MH energize. If not, confirm that the appliance is not in a defrost cycle, 8-hr. DT is operating properly, temperature is above setpoint, and CTh is closed. Check voltage on 8-hr. DT. In cooling, 115VAC is present on both DT terminal #1 (BK) and DT terminal #4 (BK) to a neutral (W). If 115VAC is present on terminal #2 (R) to a neutral (W), advance DT out of defrost cycle or replace DT. Check both terminals of CTh (BK) to a neutral (W) for 115VAC. If 115VAC is present on one terminal and not the other, replace CTh. If 115VAC is present on both terminals, check Comp, ConFM, and EvapFM. For CRMF48(-01)(-W)(-W01) and CRMF60(-W), also see "HPS Activation (CRMF48(-01)(-W)(-W01) and CRMF60(-W))" below.

   Check voltage at Comp, external protector, and Comp terminals. Check Comp windings. Check voltage on ConFM and EvapFM. Check ConFM and EvapFM windings. Check fan blades for binding.

   If Comp, ConFM, and EvapFM are energized and the cabinet temperature does not cool down, check for a restriction in the refrigeration circuit, low refrigerant charge, inefficient Comp, or defective TXV (CRMF48(-01)(-W)(-W01) auxiliary codes A-5 and B-5).

   HPS Activation (CRMF48(-01)(-W)(-W01) and CRMF60(-W)): Check continuity of HPS. If open, allow time for system pressure to equalize and HPS to reset. If HPS does not reset, replace HPS and diagnose reason for HPS activation. Confirm ConFM is energized and fan blade turns freely. Check that the condenser coil is not clogged or restricted. Check that there are no restrictions in the refrigeration circuit (drier, TXV (auxiliary codes A-5 and B-5)).

   Confirm that the appliance location meets factory requirements:

   - This appliance is not intended for outdoor use. Normal operating ambient temperature should be within 45°F to 100°F (7°C to 38°C).
   - The appliance should not be located next to ovens, grills, or other high heat producing equipment.
   - A minimum of 1.5" (4 cm) overhead clearance should be provided for proper ventilation.

5) **Cool Down Achieved**–Temperature cools to setpoint. CTh opens. Comp, ConFM, EvapFM, PH, and MH de-energize. **Diagnosis:** If temperature has cooled to setpoint and Comp, ConFM, EvapFM, PH, and MH do not de-energize, check CTh continuity. If CTh defective, replace CTh.

6) **Defrost–***Defrost Initiation:* 8-hr DT terminates. DH energizes. If CTh closed, Comp, ConFM, EvapFM, PH, and MH de-energize.

Defrost Termination: 20-min. DT terminates. DH de-energizes. If CTh closed, Comp, ConFM, EvapFM, PH, and MH energize.

Diagnosis: *Defrost Initiation:* Manually advance DT cam to terminate 8-hr. DT. Confirm DH energizes and Comp, ConFM, EvapFM, PH, and MH de-energize or remain de-energized. If not, replace DT. If Comp, ConFM, EvapFM, PH, and MH de-energize, check DH. Confirm DSTh is closed. If not, let DH cool, then recheck DSTh. If DSTh is still open, replace DSTh. Check DH amp draw and DH continuity.

Defrost Termination: Wait 20-min. (±3 min.) or advance DT cam to terminate 20-min. DT. If CTh closed, confirm Comp, ConFM, EvapFM, PH, and MH energize. Confirm DH de-energizes. If not, check DT voltage terminal #2 (R) to a neutral (W). If 115VAC is present, replace DT.

7) **PH and MH Diagnosis:** Check that PH and MH energize. Check for 115VAC at PH and MH. If 115VAC is not present, check power supply. If 115VAC is present, check amp draw of PH and MH. If an amp reading is not present, check the continuity of PH and MH. If defective, replace PH or MH.

Legend: **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermostat;
DH–defrost heater; **DSTh**–defrost safety thermostat;
8-hr. DT–8-hour defrost timer; **20-min. DT**–20-minute defrost timer;
EvapFM–evaporator fan motor; **HPS**–high-pressure switch; **MH**–mullion heater;
PH–perimeter heater; **TXV**–thermostatic expansion valve

C. Diagnostic Table

Before consulting the diagnostic tables, check the following:

• Check the cabinet temperature control setting. See the table for default cabinet temperature control settings.

Model	Default Cabinet Temperature Control Setting	Approximate Default Temperature
Undercounter Worktop	Between 4 and 5	Refrigerator: 34°F (1°C) Freezer: -5°F (-21°C)
Prep Table	6	34°F (1°C)

• Make sure the doors are not left open or opened too often and that they are sealing properly.

• On prep tables, pans and rail dividers must be in place. Otherwise, the rail will not cool properly.

• Make sure product is not blocking airflow and that the cabinet is not overloaded with warm or hot product. Product should be allowed to cool before putting in the appliance. On prep tables, only load ingredients that have been pre-chilled to 37°F (3°C) or less.

• Check for correct installation and proper voltage per appliance nameplate. This appliance is not intended for outdoor use. Normal operating ambient temperature:
  – Undercounter and Worktop 45°F to 100°F (7°C to 38°C)
  – Prep Table 45°F to 86°F (7°C to 30°C)

• The appliance should not be located next to ovens, grills, or other high heat producing equipment. A minimum of 1.5" (38 mm) overhead clearance is required for proper ventilation.

1. Appliance Not Cooling

Appliance Not Cooling - Possible Cause	
1. Power Supply	a) Unplugged, blown fuse, or tripped or defective circuit breaker.
	b) Loose connection.
	c) Not within specifications.
2. Power Cord and Plug	a) Loose connection.
	b) Defective.
3. Wiring	a) Loose connection or open.
	b) Faulty.
4. Evaporator Fan	a) Defective.
	b) Fan blade binding.
5. Compressor External Protector	a) Dirty condenser.
	b) Condenser fan not operating.
	c) Defective.
	d) Start relay defective.
	e) Low charge.
	f) Start capacitor (if applicable) defective.
6. Compressor	a) Defective.
7. Condenser	a) Dirty.
8. Evaporator	a) Dirty or frozen up.
9. Refrigerant/Refrigerant Lines	a) Gas leak.
	b) Refrigerant lines or components restricted.
10. High-Pressure Switch CRMR60 and CRMR72 prep table, CRMF48(-01)(-W)(-W01), and CRMF60(-W)	a) Dirty condenser.
	b) Ambient temperature too warm.
	c) Condenser fan not operating.
	d) Refrigerant overcharge.
	e) Refrigerant lines or components restricted.
	f) Bad contacts.
11. Thermostatic Expansion Valve (not adjustable) CRMF48(-01)(-W)(-W01) (auxiliary codes A-5 and B-5)	a) Defective.

2. Evaporator is Frozen Up

Evaporator is Frozen Up - Possible Cause	
1. Evaporator	a) Dirty.
2. Evaporator Fan	a) Defective.
	b) Fan blade binding.
3. Refrigerant Charge	a) Low.
4. Defrost Heater (freezer)	a) Defective.
5. Defrost Timer (prep table and freezer)	a) Defective.
6. Defrost Safety Thermostat Open (freezer)	a) Defective.
7. Thermostatic Expansion Valve (not adjustable) CRMF48(-01)(-W)(-W01) (auxiliary codes A-5 and B-5)	a) Defective.

3. Defrost Fails to Initiate or Terminate

Defrost Fails to Initiate or Terminate - Possible Cause	
1. Defrost Timer (prep table and freezer)	a) Defective.

III. Controls and Adjustments

A. Temperature Settings

1. Temperature Reading

A thermometer with both °F and °C scales is mounted in the cabinet. See Fig. 1.

2. Cabinet Temperature

The appliance features a cabinet temperature control dial. The warmest setting is 1 and the coldest setting is 7. See the table for default cabinet temperature control settings.

Model	Default Cabinet Temperature Control Setting	Approximate Default Temperature
Undercounter Worktop	Between 4 and 5	Refrigerator: 34°F (1°C) Freezer: -5°F (-21°C)
Prep Table	6	34°F (1°C)

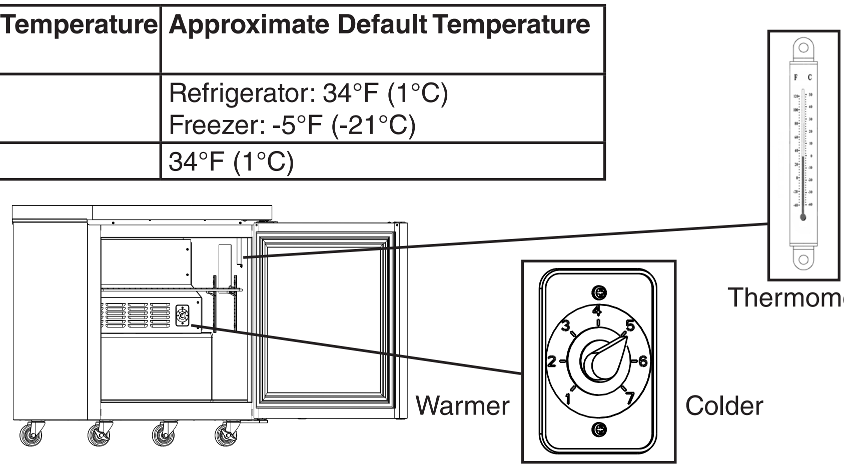


Fig. 1

B. Defrost

1. Refrigerator: Undercounter and Worktop

Off-cycle defrost between run cycles.

2. Refrigerator: Prep Table and Freezer: All

Time-Initiated Defrost Cycle: Prep table refrigerators and all freezers have a 20-minute defrost cycle once every 8 hours. Defrost cycle initiation and termination are controlled by the defrost timer.

Prep Table Refrigerators: The evaporator fan motor remains energized and all other components de-energize during the defrost cycle.

Freezers: The defrost heater energizes and all other components de-energize during the defrost cycle. There is an in-line defrost safety thermostat.

To initiate a manual defrost cycle follow the steps below.

1) Make sure the appliance is unplugged, then remove the rear panel. See Fig. 2.
2) Rotate the defrost timer cam clockwise until it clicks. When the appliance is plugged in it will start in a 20-minute defrost cycle. To bypass the defrost cycle and start at the beginning of an 8-hour interval, rotate the defrost timer cam clockwise until it clicks a 2nd time.
3) Replace the rear panel in its correct position.
4) Plug the appliance into the electrical outlet.

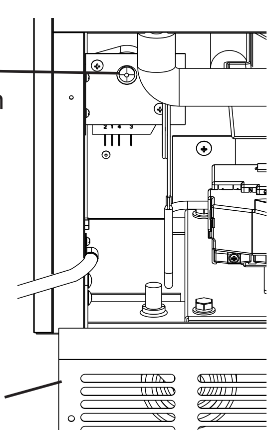


Fig. 2

C. Safety Devices

1. Compressor External or Internal Protector (All Models)

If combined temperature/amperage value is above the limit specified by the compressor manufacturer, the compressor protector operates independently to turn off the compressor. The compressor protector de-energizes the compressor until the temperature/amperage value returns to an acceptable level.

2. High-Pressure Switch (CRMR60 and CRMR72 Prep Table, CRMF48(-01)(-W)(-W01), and CRMF60(-W))

If pressure on the high-side of the appliance exceeds Hoshizaki specifications, the high-pressure switch activates and interrupts the compressor circuit, de-energizing the compressor until the pressure returns to an acceptable level.

If the condenser fan motor is operating and the compressor is off, it is most likely that the compressor protector opened. If both the compressor and condenser fan motor are off, it is most likely the appliance is off or the high-pressure switch has opened.

D. Perimeter/Mullion Heater

Freezers are equipped with perimeter and mullion heaters.

IV. Refrigeration Circuit and Component Service Information

⚠ WARNING

- This appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- To reduce the risk of electric shock, do not touch the plug with damp hands.
- Unplug the appliance from the electrical outlet before servicing.
- Make sure all food zones in the appliance are clean after the appliance is serviced. For cleaning procedures, see "VI.A. Cleaning".

A. Refrigeration Circuit Service Information

⚠ WARNING

- Repairs requiring the refrigeration circuit to be opened must be performed by properly trained and EPA-certified service personnel.
- Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-134a as a mixture with pressurized air for leak testing.

NOTICE

- Always recover the refrigerant and store it in an approved container. Do not discharge the refrigerant into the atmosphere.
- Do not leave the system open for longer than 15 minutes when replacing or servicing parts. The Polyol Ester (POE) oils used in R-134a appliances can absorb moisture quickly. Therefore it is important to prevent moisture from entering the system when replacing or servicing parts.
- Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow.
- When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

1. Refrigerant Recovery

No refrigerant access valves are provided on this appliance. Using proper refrigerant practices, utilize a temporary tap-line valve on the high side to recover the refrigerant. Store the refrigerant in an approved container. Do not discharge the refrigerant into the atmosphere.

After recovery is complete, replace the tap-line valve with a proper, permanent access valve.

2. Brazing

⚠ WARNING

- R-134a itself is not flammable at atmospheric pressure and temperatures up to 212°F (100°C).
- R-134a itself is not explosive or poisonous. However, when exposed to high temperatures (open flames), R-134a can be decomposed to form hydrofluoric acid and carbonyl fluoride both of which are hazardous.
- Do not use silver alloy or copper alloy containing arsenic.
- Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-134a as a mixture with pressurized air for leak testing.

1) Braze all fittings while purging with nitrogen gas flowing at a pressure of 3 to 4 PSIG.

NOTICE

- Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow.
- When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

2) Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-134a as a mixture with pressurized air for leak testing.

3. Evacuation and Recharge (R-134a)

1) Attach a vacuum pump to the system. Be sure the high-side charging hose is connected to the field-installed high-side access valve.

IMPORTANT

The vacuum level and vacuum pump may be the same as those for current refrigerants. However, the rubber hose and gauge manifold to be used for evacuation and refrigerant charge should be exclusively for POE oils.

2) Turn on the vacuum pump, then open the high-side valve on the gauge manifold. Never allow the oil in the vacuum pump to flow backwards.

3) Allow the vacuum pump to pull down to a 29.9" Hg vacuum. Evacuating period depends on pump capacity.

4) Close the high-side valve on the gauge manifold.

5) Disconnect the gauge manifold hose from the vacuum pump and attach it to a refrigerant service cylinder. Remember to loosen the connection and purge the air from the hose. See the nameplate for the required refrigerant charge. Hoshizaki recommends only virgin refrigerant or reclaimed refrigerant which meets the requirements of ARI Standard 700 (latest edition) be used.

6) A liquid charge is recommended when charging an R-134a system. Place the service cylinder on the scales; if the service cylinder is not equipped with a dip tube, invert the service cylinder, then place it on the scales. Open the high-side valve on the gauge manifold.

7) Allow the system to charge with liquid until the proper charge weight is met.

8) Close the high-side valve on the gauge manifold, then close the refrigerant access valve (if applicable). Disconnect the gauge manifold hose.

9) Cap the access valve to prevent a possible leak.

B. Component Service Information

NOTICE
When replacing a component listed below, see the notes to help ensure proper operation.

Component	Notes
Compressor	Install a new start relay and compressor external protector. **WARNING! To reduce the risk of electric shock, be sure to reconnect the compressor's ground wire.**
Thermostatic Expansion Valve CRMF48(-01)(-W)(-W01) (auxiliary codes A-5 and B-5)	• Attach the thermostatic expansion valve bulb to the suction line in the same location as the previous bulb. • The bulb should be between the 10 and 2 o'clock positions on the tube. • Secure the bulb with the clamp and holder.

C. Door Reversal

This appliance is provided with a cabinet design which, after being delivered to the installation location, permits changing of the door swing from left to right or right to left. To change the door swing, follow the steps below. Example shows change from right hinged to left hinged.

⚠ WARNING
• Wear eye protection when reversing the doors. • Keep fingers away from edge of upper hinge bracket. Spring cartridge can cause the upper hinge bracket to move suddenly with extreme force.

1) Make sure the appliance is unplugged from the electrical outlet and the casters are locked.
2) Open the door to the fully open position, then remove the inner screw from the upper hinge bracket. See Fig. 3.
3) Close the door. **WARNING! Keep away from upper hinge bracket. Upper hinge bracket kicks out when door is closed.** See Fig. 4. Remove the outer screw from the upper hinge bracket.

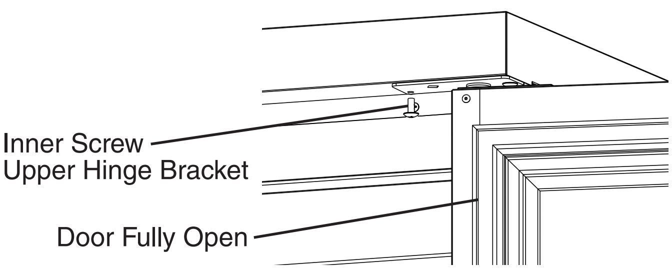


Fig. 3

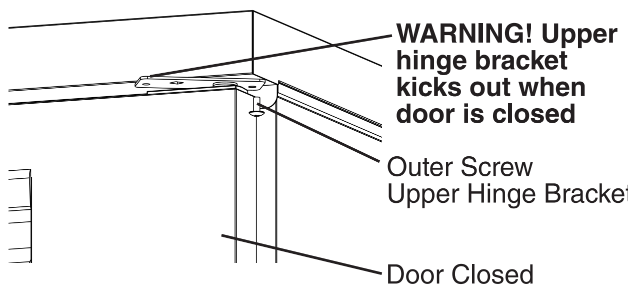


Fig. 4

4) While maintaining a hold on the door, remove the lower hinge bracket. See Fig. 5. Leave the thrust-washer in place.
5) Pull out the bottom of the door slightly and gently remove the door from the appliance.
6) Remove the upper hinge bracket from the spring cartridge. See Fig. 6.

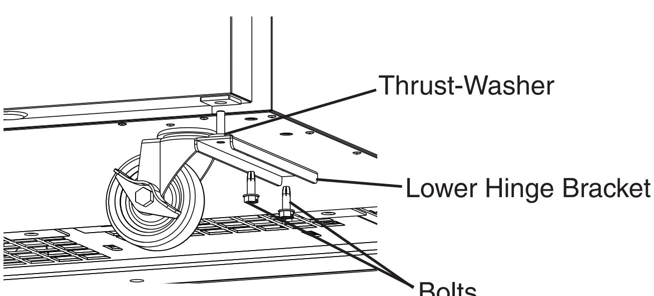


Fig. 5

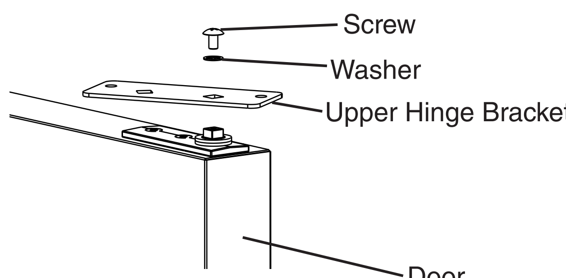
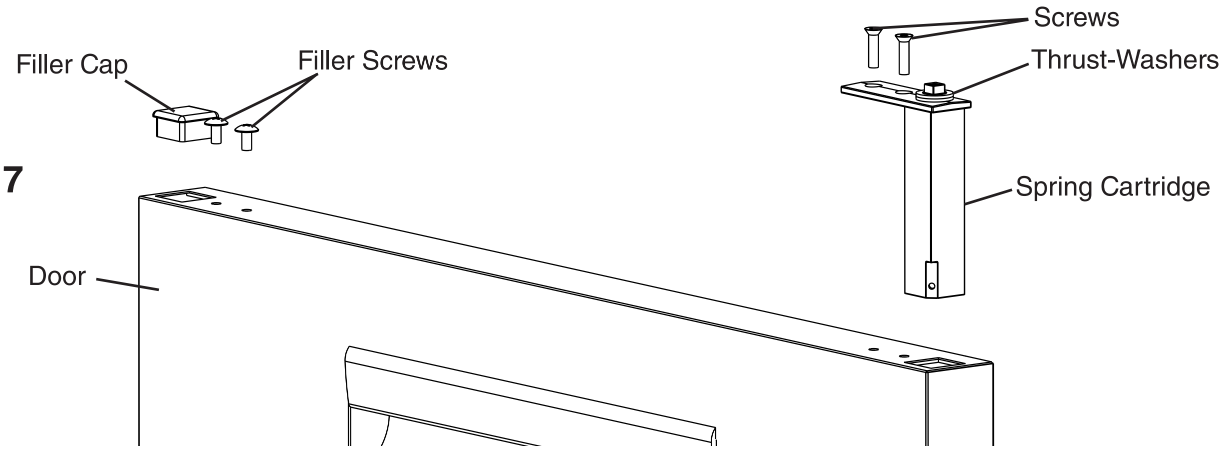


Fig. 6

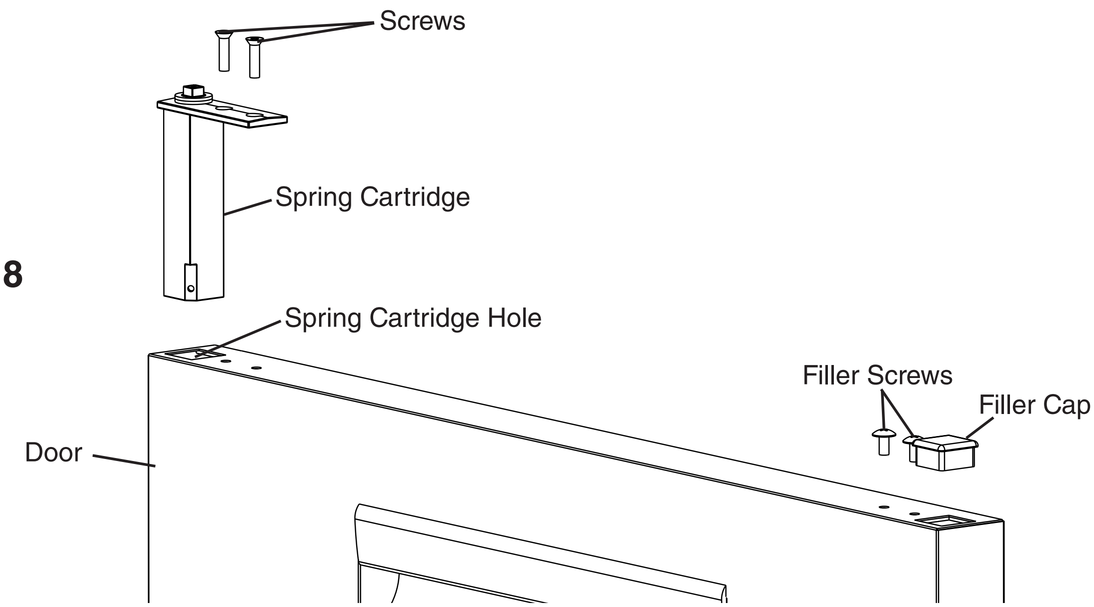
7) Remove the filler cap, filler screws, and spring cartridge. See Fig. 7. Leave the thrust-washers in place on the spring cartridge. ***NOTICE!*** **Spring cartridge may be difficult to remove. Be careful not to damage the finish.**

Fig. 7



8) Clear material from the spring cartridge hole to allow for spring cartridge installation. Reinstall the filler cap, filler screws, and spring cartridge on the opposite side of the door. See Fig. 8.

Fig. 8



9) Make sure the thrust-washers are in place on the spring cartridge, then install the upper hinge bracket onto the spring cartridge. See Fig. 9. The upper hinge bracket should be canted out towards the center as shown with the screw holes towards the back of the appliance.

10) Remove the filler cap and nylon bearing from the bottom of the door. See Fig. 10. Reinstall on the opposite side.

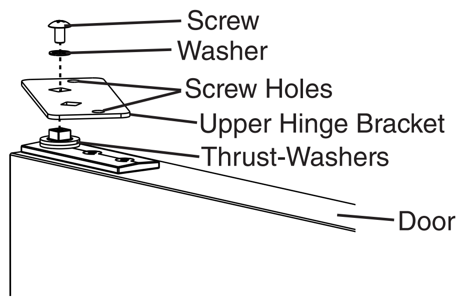


Fig. 9

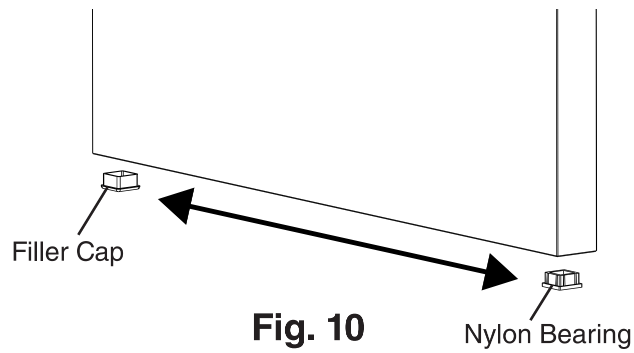


Fig. 10

11) Move the door into position and maintain a hold on the door. Make sure the thrust-washer is in place, then install the lower hinge bracket. Do not tighten the bolts yet. Start each bolt for a few threads only and leave loose. See Fig. 11.

12) Install the outer screw into the upper hinge bracket. Do not tighten the screw yet. Start the screw for a few threads only and leave loose. See Fig. 12.

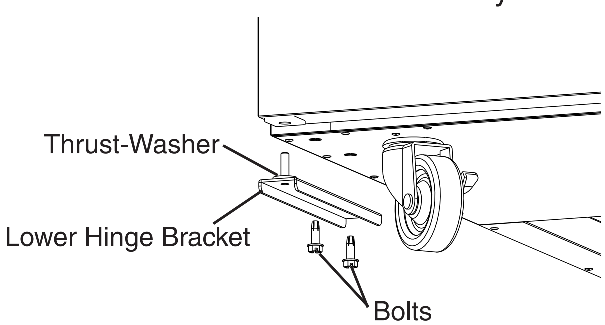


Fig. 11

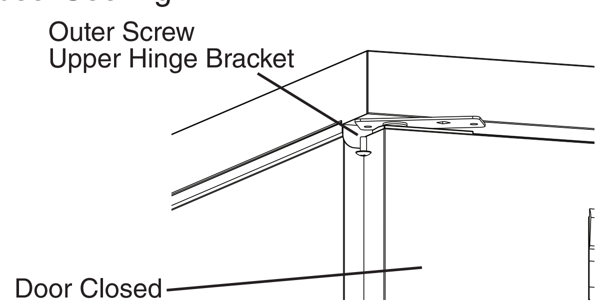


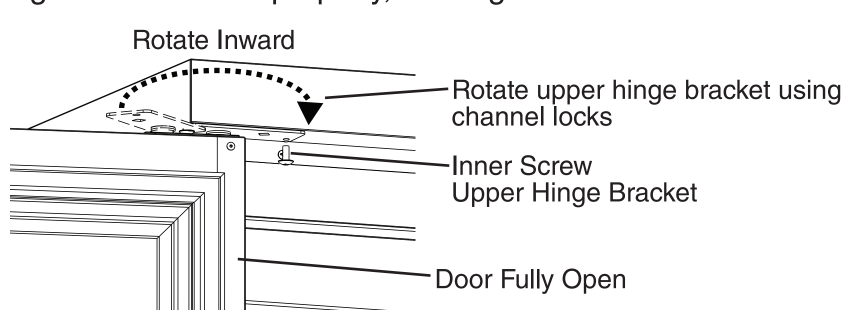
Fig. 12

13) Open the door to the fully open position.

14) Rotate the upper hinge bracket inward into position using channel locks. See Fig. 13. ***NOTICE!*** **Be careful not to damage the finish.** Install the inner screw into the upper hinge bracket.

15) Verify that the door is aligned and closes properly, then tighten all fasteners.

Fig. 13



V. Maintenance

⚠ WARNING

- Unplug the appliance before performing maintenance to prevent electric shock or injury by moving parts. To reduce the risk of electric shock, do not touch the plug with damp hands.
- Before performing maintenance, move all foods into another clean refrigerator or freezer.

1. Condenser

Check the condenser once a year and use a brush or vacuum cleaner to clean the condenser as required.

2. Power Supply Connection

If the plug or power cord is damaged, contact your local Hoshizaki service representative or local Hoshizaki distributor immediately and ask for repairs.

All other maintenance or service on this appliance should be performed in accordance with the Hoshizaki Service Manual by a qualified service technician.

VI. Preparing the Appliance for Periods of Non-Use

When shutting down the appliance for periods of non-use, follow the instructions below.

⚠ WARNING
Prevent the doors from closing to reduce the risk of children getting trapped.

NOTICE
Clean the cabinet interior, door gaskets, and shelves. See "VI.A. Cleaning" for details.

1) Before shutting down the appliance, move the stored food into another refrigerator or freezer.

2) Unplug the appliance. **WARNING! To reduce the risk of electric shock, do not touch the plug with damp hands.**

VII. Disposal

When disposing of the appliance, follow the instructions below.

⚠ WARNING
Remove the door to reduce the risk of children getting trapped. Leave the shelves in place so that children may not easily climb inside.

This appliance contains refrigerant and must be disposed of in accordance with applicable national, state, and local codes and regulations. Refrigerant must be recovered by properly certified service personnel.

VIII. Technical Information

A. Electrical and Refrigerant Data

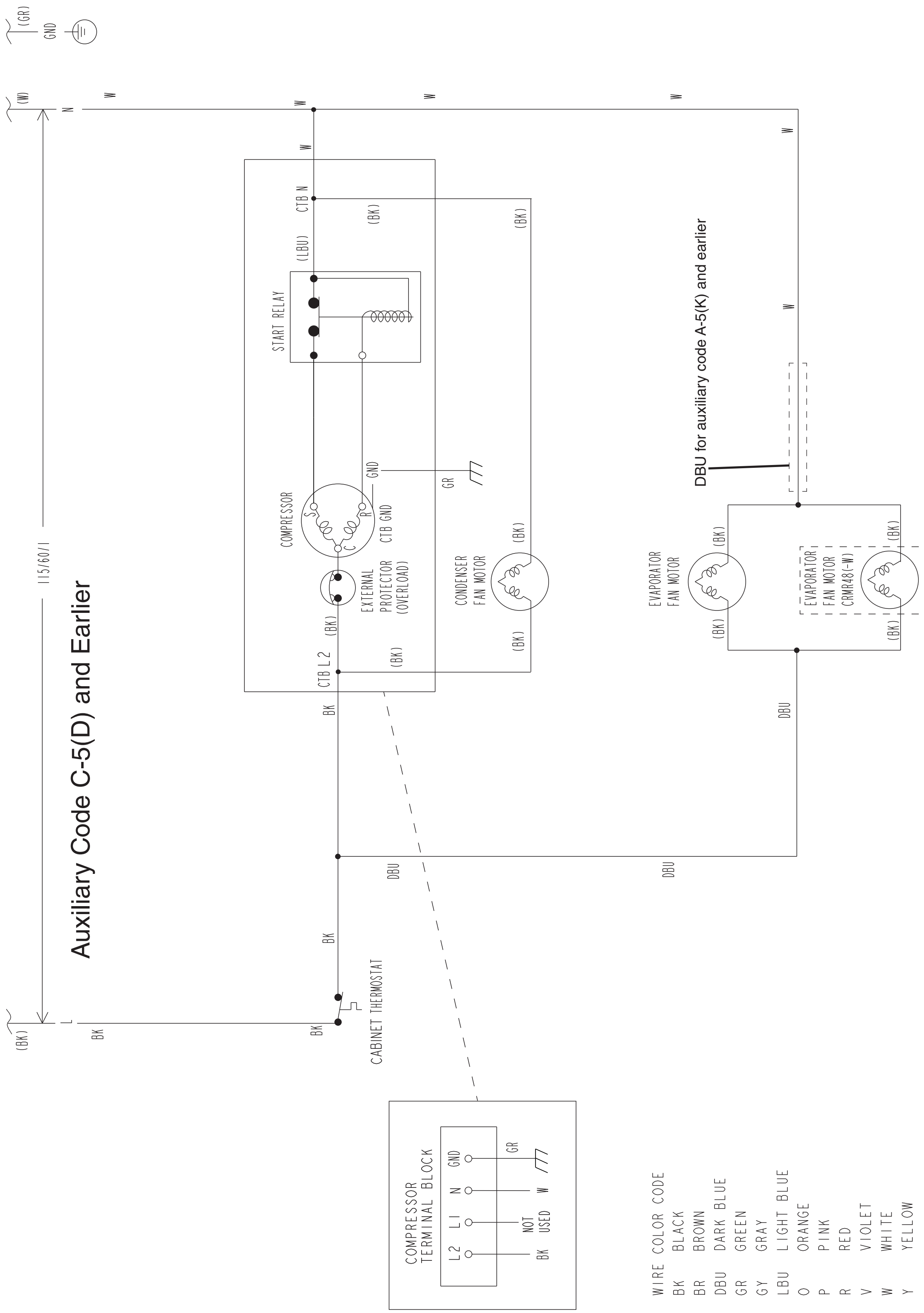
Model	AC Supply Voltage	Amperes	Design Pressure (PSIG)		Refrigerant (oz.)
			HIGH	LOW	134a
CRMR27(-01)(-W)(-W01)(-8)(-12M)	115/60/1	2.6	290	120	5.6
CRMF27(-01)(-W)(-W01)	115/60/1	3.4	310	120	5.0
CRMR48(-01)(-W)(-W01)	115/60/1	2.6	240	120	6.5
CRMR48 Prep Table (-8)(-12)(-12M)(-18M)	115/60/1	2.6	290	120	6.5
CRMF48(-01)(-W)(-W01)	115/60/1	6	360	140	9.2
CRMR60(-W)	115/60/1	4.2	290	120	8
CRMR60 Prep Table (-8)(-12)(-12M)(-16)(-18M)(-24M)	115/60/1	6	360	140	10.3
CRMF60(-W)	115/60/1	6	360	140	10.6
CRMR72(-W)	115/60/1	4.2	290	120	8
CRMR72 Prep Table (-12)(-16)(-18)(-18M)(-24M)(-30M)	115/60/1	6	360	140	12

See the nameplate for electrical and refrigeration specifications. The nameplate is located inside the cabinet.
We reserve the right to make changes in specifications and design without prior notice.

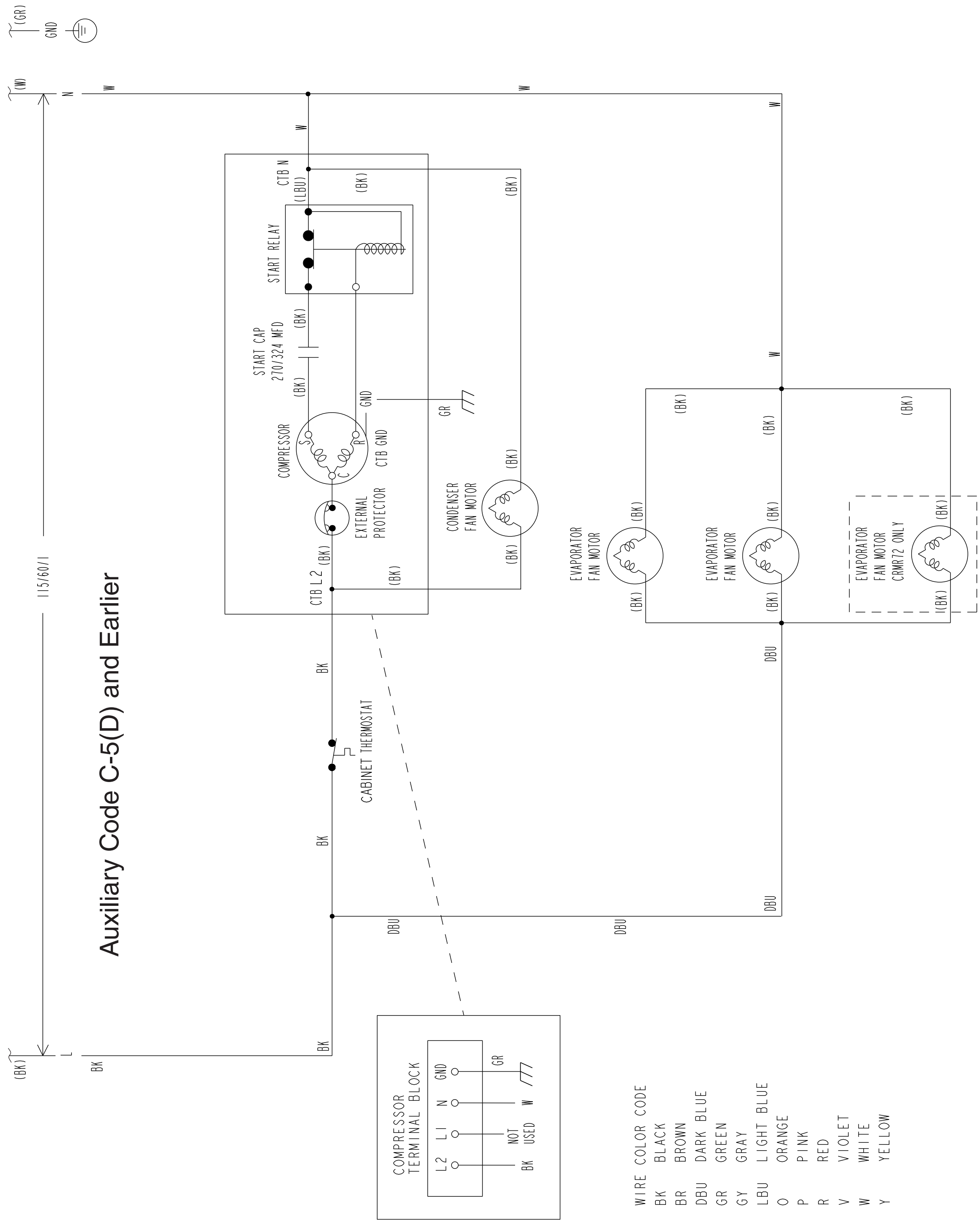
B. Wiring Diagrams

1a. Refrigerator: Undercounter and Worktop Auxiliary Code C-5(D) and Earlier

a) CRMR27(-01)(-W)(-W01), CRMR48(-01)(-W)(-W01)

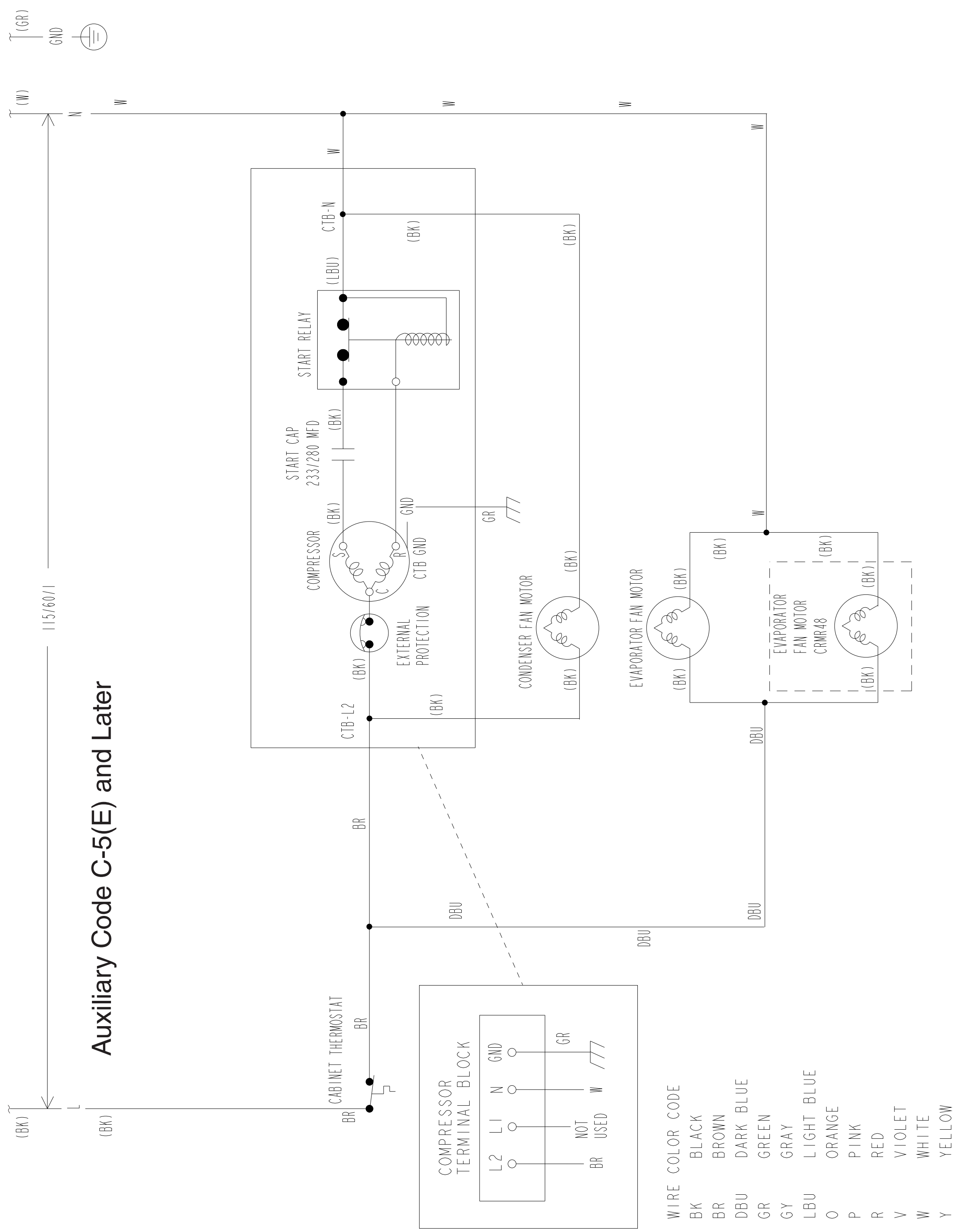


b) CRMR60(-W), CRMR72(-W)

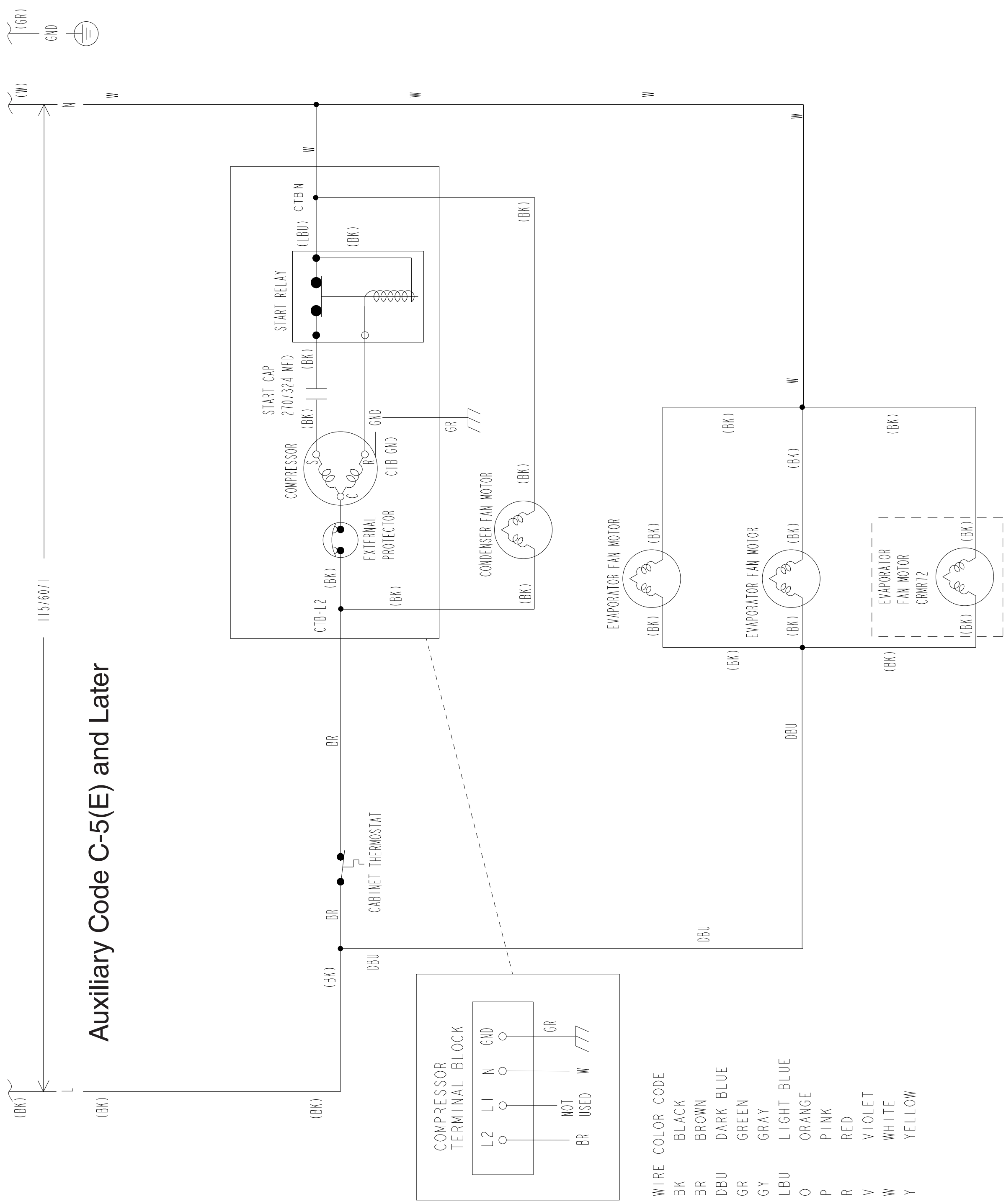


1b. Refrigerator: Undercounter and Worktop Auxiliary Code C-5(E) and Later

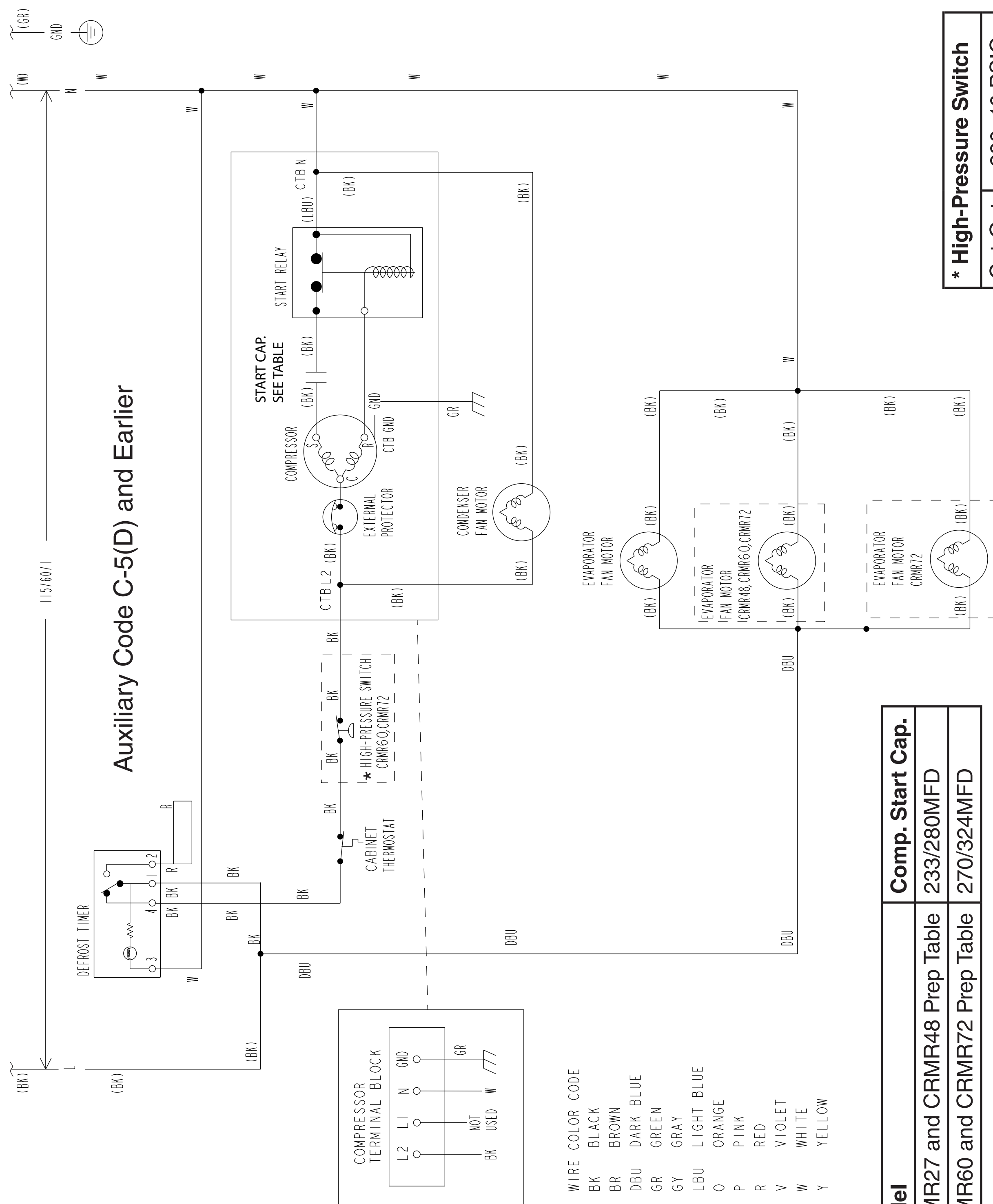
a) CRMR27(-01)(-W)(-W01), CRMR48(-01)(-W)(-W01)



b) CRMR60(-W), CRMR72(-W)



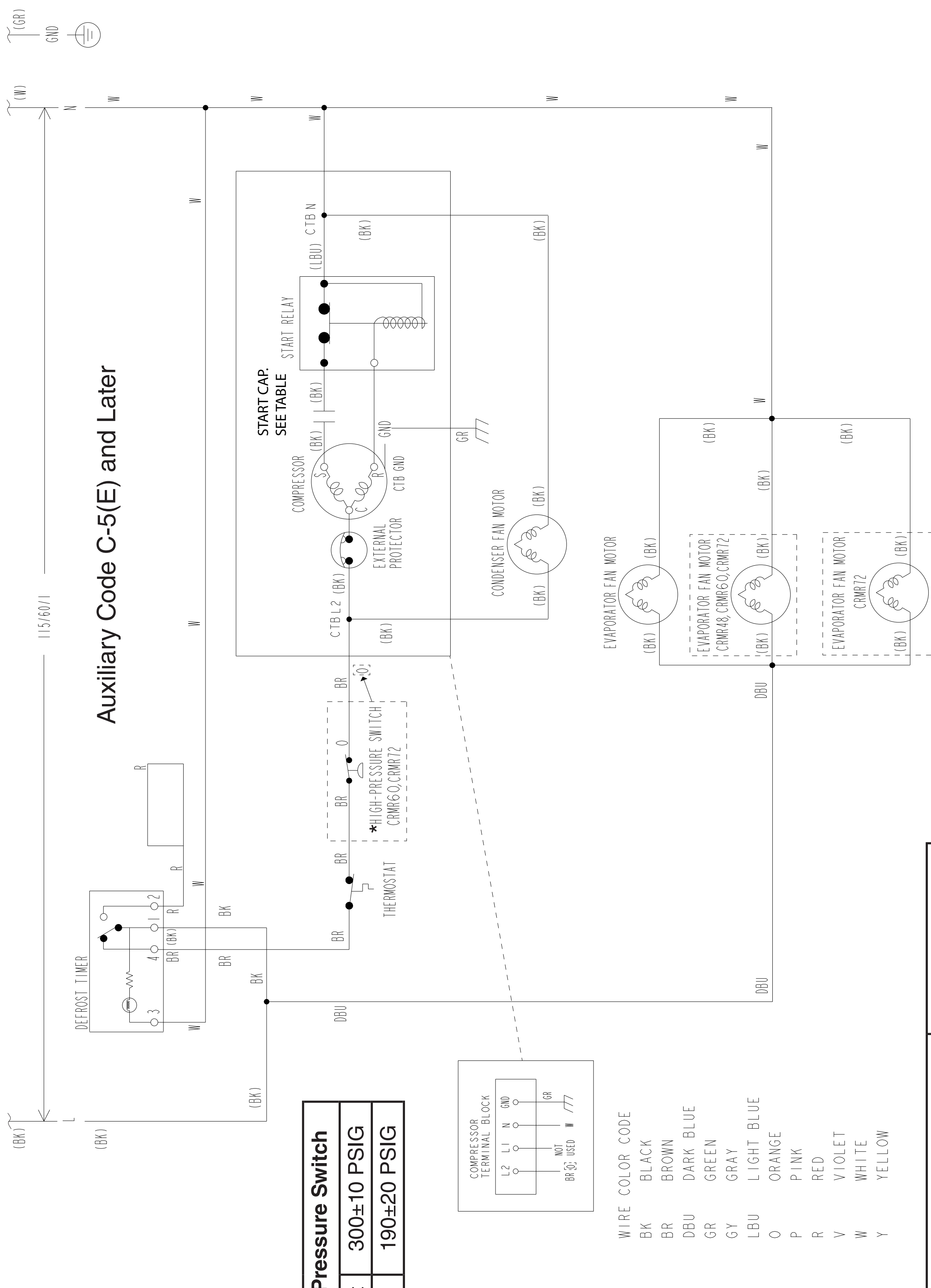
2a. Refrigerator: Prep Table Auxiliary Code C-5(D) and Earlier



* High-Pressure Switch	
Cut-Out	300±10 PSIG
Cut-In	190±20 PSIG

Model	Comp. Start Cap.
CRMR27 and CRMR48 Prep Table	233/280MFD
CRMR60 and CRMR72 Prep Table	270/324MFD

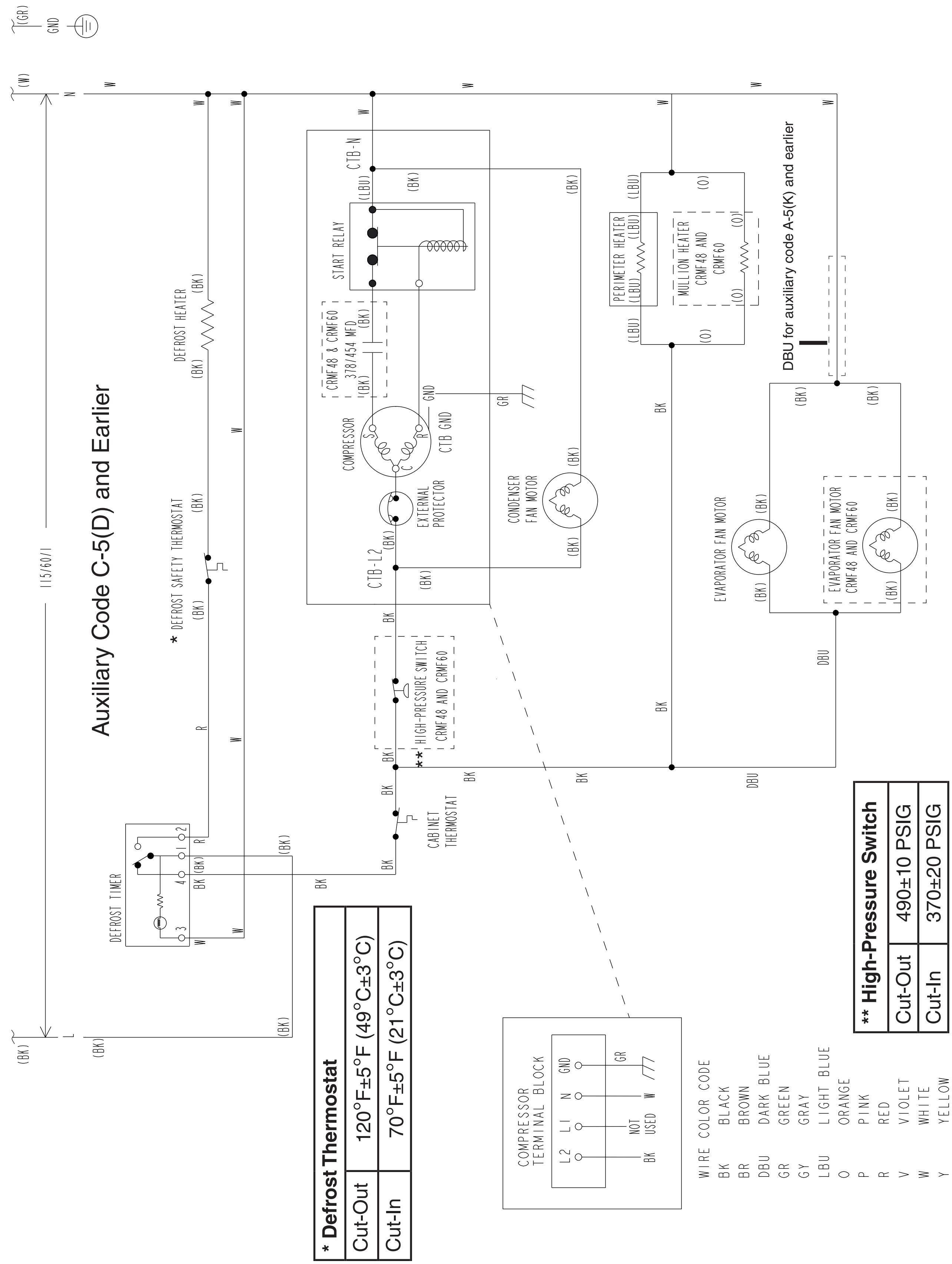
2b. Refrigerator: Prep Table Auxiliary Code C-5(E) and Later



* High-Pressure Switch	
Cut-Out	300±10 PSIG
Cut-In	190±20 PSIG

Model	Comp. Start Cap.
CRMR27 and CRMR48 Prep Table	233/280MFD
CRMR60 and CRMR72 Prep Table	270/324MFD

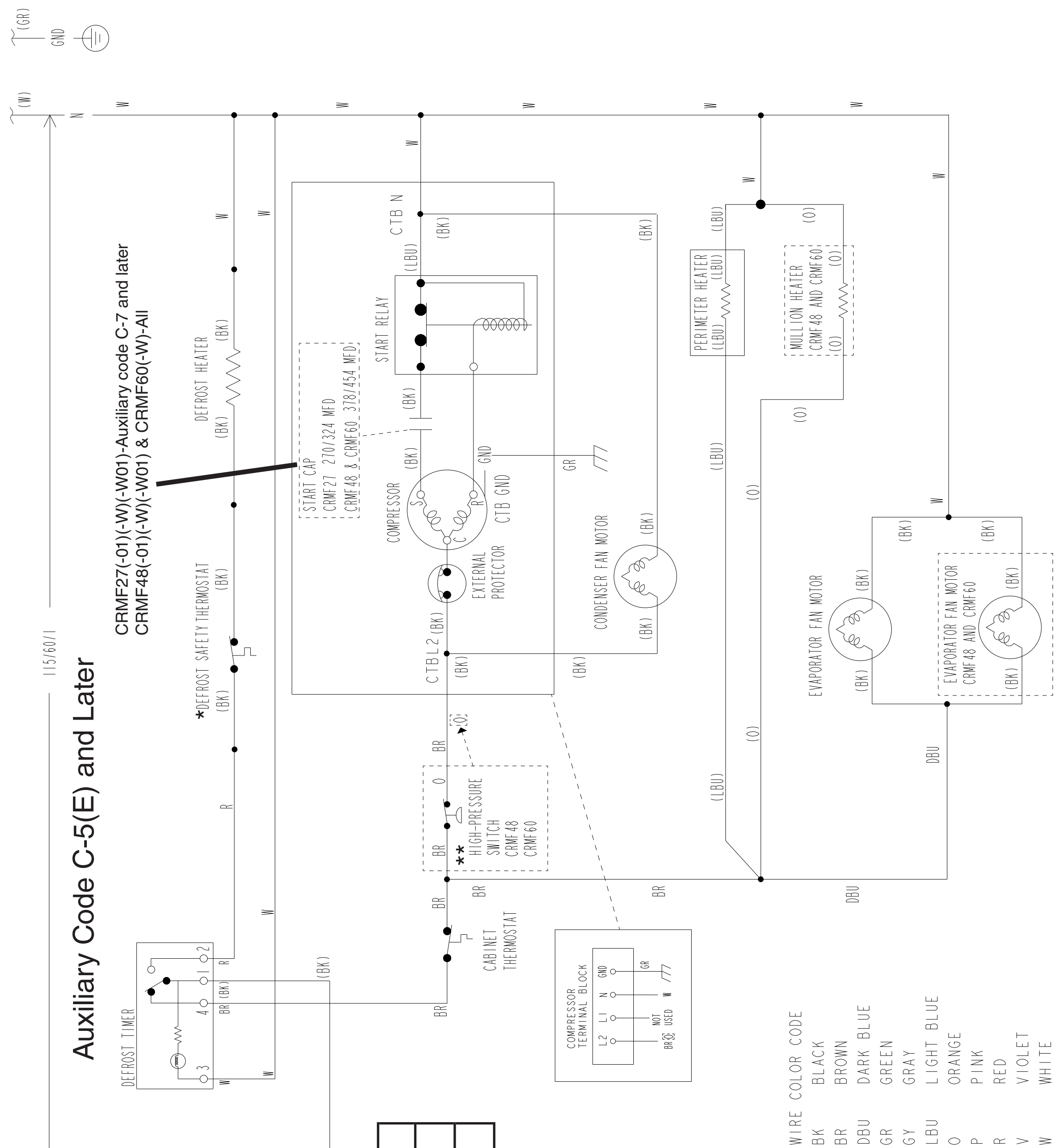
3a. Freezer: All Auxiliary Code C-5(D) and Earlier



* Defrost Thermostat	
Cut-Out	120°F±5°F (49°C±3°C)
Cut-In	70°F±5°F (21°C±3°C)

** High-Pressure Switch	
Cut-Out	490±10 PSIG
Cut-In	370±20 PSIG

3b. Freezer: All Auxiliary Code C-5(E) and Later



* Defrost Thermostat	
Cut-Out	120°F±5°F (49°C±3°C)
Cut-In	70°F±5°F (21°C±3°C)

** High-Pressure Switch	
Cut-Out	490±10 PSIG
Cut-In	370±20 PSIG